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METHOD AND SYSTEM FOR AUTOMATICALLY CONFIGURING AN AUDIO ENVIRONMENT

BACKGROUND OF THE INVENTION

Field of the Invention

[0001] The present invention relates to audio systems, and more particularly to audio systems that can be configured to optimize audio signal output and sound reproduction regardless of the source of the audio signal.

Description of the Related Art

[0002] Technological trends in consumer audio equipment have created audio systems that are increasingly sophisticated and that produce sound quality that rivals professional-level systems. The increased popularity of home theatres, along with the advances provided by digital encoding of audio and video data, has fueled the demand for audio systems that can produce theatre-quality sound to accompany the high-resolution video provided by digital systems.

[0003] There is a need for a system that provides end users with optimal audio output for any combination of audio encoding format, delivery channel, and sound system based on the capabilities of the end user's specific equipment and personal preferences.

SUMMARY OF THE INVENTION

[0004] The present invention is directed to a method and system for automatically configuring a user's listening environment for optimal sound reproduction based on the characteristics of the specific audio signal being transmitted and the specific service the user is listening and possibly also watching.

BRIEF DESCRIPTION OF THE DRAWINGS

[0005] Figure 1 is a block diagram illustrating one embodiment of the inventive system; and

[0006] Figure 2 is a block diagram illustrating another embodiment of the inventive system

DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0007] The invention is directed to providing both data and control mechanisms for enabling automated optimization of a listening environment. The invention covers two aspects that provide the necessary automation: providing control data (e.g., configuration information) and automating the control.

[0008] One manner in which sound quality can be improved is through multiple channels, first offered via analog technologies such as Dolby Stereo (tm) and Dolby Surround (tm) and later offered through advanced digital audio encoding schemes that use multiple channels. Examples of such audio encoding schemes include MPEG-2 Audio, Dolby Digital (tm) and dts(tm). Using Dolby Digital(tm) as an example, an audio signal that is created and encoded for output via multiple discrete full-range channels would require discrete multi-channel audio reproduction equipment for optimum sound reproduction. If the user does not have multi-channel equipment, it is possible to either deliver the sound through a less than optimal playback system (e.g., via a four channel system rather than a six channel system), at some sacrifice to the intended sound quality of the original audio signal, by conforming the original signal to the parameters of the available playback system. Some playback systems allow the user to adjust the playback parameters manually to adapt to different audio encoding schemes if the user knows the scheme that was used to generate and encode the data. To further optimize audio reproduction, the user should also be aware of the delivery mechanism used between the

audio signal source and the user's playback system so that the user can conduct further configuration for optimizing the audio output.

[0009] As the number and types of multi-channel sound systems has increased, the number of permutations and combinations of audio encoding formats, sound systems and delivery channels has also increased to the point where manual configuration becomes relatively complex. Although there have been attempts by audio equipment manufacturers to provide sufficient information for users to configure their audio equipment for optimal sound reproduction, this still requires the user to determine how the audio signals were produced and transmitted and, with this information, configure their audio electronic equipment via any number of controls to reproduce the audio signals properly. This requires users to conduct their own research regarding both audio signal production and their audio equipment, which tends to be overly cumbersome for the average user even if that user is a critical listener. The user's own environment, and specifically the user's audio preferences, audio equipment reproduction capabilities and in-room speaker configuration can further complicate attempts to optimize audio reproduction. To further complicate the process, these configuration attempts assume that the audio signal information, such as information regarding the original audio encoding scheme, is even available to the user, which it often is not.

[0010] Audio encoding and transmission parameters can change from one program to another, from a program to a commercial (and vice versa), or from an analog radio, videocassette, or television program to a digital audio CD, digital television program , or DVD. However, failure to configure the listener's equipment to account for these variations will create less-than-optimal sound reproduction, a problem that can be particularly noticeable for critical listeners. Although some companies have attempted to address this problem by automatically configuring the listener's audio equipment to optimize sound reproduction for any given audio source, these systems are only able to conduct automatic configuration for a limited number of systems and tend to focus on limited portions of the audio system (e.g., solely on the audio encoding format) without